

## VERIFICATIONS.

*Indications.*—As worked up and issued to the public three times daily, they have been carefully compared with the actual conditions during the succeeding twenty-four hours, with the following result:—the percentage verified averages 84.2 for New England; 83.0, Middle Atlantic States; 86.6, South Atlantic States; 88.0, East Gulf States; 86.5, West Gulf States; 87.3, Ohio valley and Tennessee; 87.6, Lower Lake region; 86.1, Upper Lake region; 88.0, Upper Mississippi valley; 82.9, Lower Missouri valley. For all the districts the average verified is 86.0 per cent. By elements the percentage verified averages 89.7 for the weather; 88.8, wind-direction; 83.3, temperature; 82.3, barometer. There were 15 omissions to predict, (3 for weather, 3 for wind-direction, 6 for temperature and 3 for barometer,) out of 3,600, or 0.42 per cent. Of the predictions made, 2.7 per cent., are recorded as having completely failed; 3.3 per cent., as one-fourth verified; 14.3 per cent., as one-half verified; 6.5 per cent., as three-fourths verified; 73.2 per cent., as fully verified.

*Cautionary Signals.*—During the month 147 Cautionary Signals were displayed; 115, or 78.2 per cent., were justified by subsequent hourly velocities of 25 miles or over at, or within 100 miles of, the station. Thirty-three cases were reported of winds of 25 miles or over where signals were not ordered.

## NAVIGATION.

*Stages of Water in Rivers.*—In the table on the right side of chart No. III are given the highest and lowest readings of the Signal Service gauges for the month, with the dates. The changes in the Savannah, Monongahela, Youghiogeny, Ohio, Cumberland, Tennessee, Upper Mississippi and Arkansas were unimportant. In the Allegheny, at Freeport, there was a sudden rise to near the "danger-line" on the 10th and 11th. The Mississippi was high and near the "danger-line" at Vicksburg and New Orleans during the first half of the month. At Shreveport the Red river rose quite steadily up to the 20th and then fell to 24 ft. 10 in. by the 30th. The Missouri was slightly above the "danger-line" at Brunswick, Mo., from the 27th to the close of the month. At St. Joseph, Mo., it rose above the "danger-line" from the 6th to the 14th, and from the 22nd to end of month. It continued above the "danger-line" at Omaha from the 6th to the 13th and after the 19th.

## ATMOSPHERIC ELECTRICITY.

*Thunder Storms.*—1st, Utah, Dakota, Neb., Iowa, Ill., Ind., Wis., Tenn., Ill., Minn. 2d, Dakota, Ind. T., Iowa, Ill., Ind., N. J., Mo., Neb., Ohio, Wis., Fla. 3d, Tex., Miss., Mich., N. Y., Ohio, Pa., W. Va., Ky., Ind., Tenn., Ga., Cal., Ill., La., N. C., S. C. 4th, Ala., Tex., Ind., Tenn., Ga., N. C., Va., Md., N. Y., Col., Ill., Iowa, Ky., Mass., Pa., Vt. Fla., Ind. T., Mont. 5th, Col., Ala., Tex., Ga., N. C., Me., Md., Dak., Minn. 6th, Ind. T., Miss., Tex., Iowa, Wis., Ga. Fla., Col., Ill., La. Neb., Dak., Ind. T. 7th, N. M., Ala., Tex., Mo., Ky., Col., Ill., Mich. Dak., Ind. Ty. 8th, Neb., W. Va., Ga., N. C., S. C., Va., Col., Ill., Kan., La., Miss., Tenn. 9th, Col., Neb., Ohio, Tenn., Ga., N. C., Va., Ala., Ill., Iowa, Ky., S. C., Nev., Fla., Mont. 10th, Col., Ala., Ohio, Mich., Ga., S. C., Fla., Ill., Ind., N. C., Tex., Wy., T., Nev., Mont. 11th, Tex., Ohio, Mich., N. Y., N. J., Pa., N. M., Wy. T., Nev. 12th, N. M., Wy. T., Kan., Neb., Ala., N. J., N. Y., Mass., Conn., Iowa, La., N. H., Pa., Tex., Vt., Va., Md., Dak., Mont. 13th, La., Tex., Mass., Me., N. Y., Conn., Ala., Fla., Neb., N. H., N. J., Ind. Ty. 14th, Neb., Tex., Iowa, La., Dak., Minn. 15th, N. M., Kan., Tex., Mo., Iowa, Mich., Ind., Ill., Ohio, Wis., Dak., Ind. Ty. 16th, Kan., Ohio, Ind., Fla., Ill., Ky. Mo., Neb., N. Y., Tex., Dak., Mont. 17th, Ind. Ty., Tex., Va., N. J., Pa., Ala., Col., La., Miss., Tex., Vt., Dak., Mont. 18th, Col., Dak., Ill., Miss., N. Y., S. C., Minn., Ga., N. C., Mont. 19th, Wy. Ty., Col., Dak., Kan., Iowa, Minn., Ga., Fla., Ill., Mo., Neb., Tex., Wis., Ind. Ty. 20th, Wy. Ty., Tex., Minn., Mich., Ohio, Ky., Ind., Cal., Fla., Ill., Iowa, Mo., Ind. Ty. 21st, Col., Tex., N. Y., Pa., Ga. Va., Cal., Fla., Ind., N. C., S. C., N. M., Mont. 22d, Col., Dak., N. J., Pa., Mass., Va., N. M., Fla. 23d, N. M., Col., Kan., Neb., N. H., Me., Dak., Vt., Nev., N. Y., Me., Mont. 24th, Col., Dak., Neb., Minn., Miss., N. Y., Mo., N. J., Pa., Ind. Ty. 25th, Col., Ind. Ty., Tex., Iowa, Dak., Ill., Mo., Neb., Ohio, N. M., Wy. Ty. 26th, N. M., Neb., Mich., Ind., Cal., Col., Ill., Mo., Ohio, Ind. Ty. 27th, Ind. Ty., Tex., Ala., La., Iowa, Ohio, W. Va., Pa., Ky., N. J., Conn., N. Y., N. H., Mass., Me., Fla., Ga., Ind., Mo., N. C., S. C., Tenn., Vt. 28th, Miss., La., Mo., Iowa, Minn., W. Va., Tenn., N. C., Va., Me., Ala., Ill., Ind., La., Md., Neb., N. J., S. C., Tex., Fla. 29th, Col., Dak., La., Tex., Ill., N. C., Ind., Iowa, Ky., Mo., Neb., S. C., Tenn., Wis., Fla., Ga. 30th, Neb., Wis., Mo., Iowa, Ohio, Ga., La., Ala., Cal., Ill., N. C., Tenn., Va., Ind. Ty.

*Auroras.*—Albany, Argyle and North Volney, N. Y., Cambridge, Mass., Woodstock and Burlington, Vt., 3rd; Auburn, N. H., 4th; Clear Creek, Neb., 26th and 28th.

*Magnetic Phenomena.*—Prof. G. Hinricks, Iowa City, Ia., reports the average magnetic diurnal range in declination as 8.28 minutes; largest range 15.7 minutes, on the 3rd.

*Telegraphic communication interfered with by Atmospheric Electricity.*—Santa Fe, greatly, 5th, 7th, 11th, 12th, 15th, 16th, 20th, 26th. Pike's Peak, 3rd, considerable; 5th, severe; 10th, very intense during storm; 15th, intense; 25th, severe, wires cut out. Colorado Springs, Col., 22nd, shattered telegraph poles and melted wires. Dodge City, 11th, atmosphere highly charged, wire from wind-vane emitted sparks. Fort Sill, 13th, obliged to cut out instruments; 30th, communication obstructed. Fred-

ericksburg, Tex., 7th, powerfully electrified; 9th, greatly. Concho, Tex., 10th, 15th, 16th. Fort Mc Kavett, Tex., 16th, screws on lightning arrester fused. Pembina, wires considerably affected, 14th, 15th, 18th; wires unmanageable, 22nd. Milwaukee, 6th, relays melted in telegraph office. Cape Henry, Va., 28th, wires badly affected, cut out instruments. Portland, Me., 13th, heavy thunder-storm, communication seriously affected. Mt. Washington, 23rd, switch cut-out had to be drawn, wire burnt dark blue; 27th, wires so seriously interfered with, that the switch cut-out had to be withdrawn.

## OPTICAL PHENOMENA.

*Solar Halos*.—1st, Ohio, Tenn., Mich., Ky. 2d, Ill., Ind., Miss., Ohio, Kan., Ky., Tenn. 3d, N. Y., Ohio, Pa., Md., Me., Dak. 4th, Neb., Ohio, Conn. 5th, Mo., N. H., N. Y., Ind., Tenn., R. I., Conn. 6th, Ill., Md., Ohio, Pa., La., Wis. 7th, Conn., Ind., N. Y., Pa., Md., Ala., La., Ohio, Ky., R. I. 8th, Me., R. I. 9th, Ill., Iowa, Mich., Wis., N. Y., Ohio. 10th, Ohio, Michigan, Cal., Fla. 11th, Ala., Wis., Ohio, N. C., Vt. 12th, Ind., N. H., Ky., Vt., Me., Cal. 13th, Conn. 14th, Ohio, N. C. 15th, Tex. 16th, Conn., Mass., Nebr., N. H., N. J., N. Y., Md., R. I., Tex. 17th, Conn., Neb., N. H., N. Y., N. C., Va., Md., Ohio, S. C., R. I. 18th, N. H., N. Y., Me. 19th, Va. 20th, Ill., Ind., Miss., N. Y., Md., Ohio. 21st, Me., Mass., N. H., N. Y., Va., Md., Conn., R. I., Vt., Nebr. 22nd, Me. 24th, Va. 25th, Ill., La., Dak., Ohio. 26th, Miss. 27th, Me., N. H., Ohio, Or. 29th, Ala. 30th, Ohio.

*Lunar Halos*.—3rd, N. J., Va., Tex. 4th, Dak. 5th, Ind., Mo., Va., Tex. 6th, N. J., Pa., Va., Ind., N. C., Conn., Mont. 7th, Mass., N. J., N. C., Mo., Minn., Ga., Va., R. I., Tex. 8th, Miss., N. C., Va., Nev., Fla., Tex. 9th, Ill., N. J., N. Y., Tex., Iowa, Ga., S. C., Conn., Minn., Idaho. 10th, Iowa, Va., Kan., Minn. 11th, Mass., N. J., Ohio, La., N. J., Cal., Fla. 12th, N. C., N. J., Ky., S. C., Tex. 13th, Ind., Ohio, Va., N. J., N. C., Me., Fla. 14th, Mo., Va. 15th, Ind., Mo., Tex., Cal. 16th, Md. 17th, Tex. 19th, Ind. 20th, Ga. 21st, Va.

*Mirage*.—Pike's Peak, Col., 9th, 24th; New London, Conn., 11th, 13th; New Bedford, Mass., 15th.

## MISCELLANEOUS PHENOMENA.

**BOTANICAL.**—*New Hampshire*—Contoocookville, in bloom, 21st, red clover. *Vermont*—West Charlotte, in bloom, 9th, red clover, 17th, white clover; ripe, 11th, field strawberries. *Massachusetts*—Somerset, in bloom, 3rd, locust; 4th, white fringe and mountain laurel. Waltham, in bloom, 3rd, sheepberry; 7th, high bush blackberry; 14th, sheep laurel; 16th, poisonfly; 18th, arrowwood; 29th, winterberry and alder; 30th, meadow sweet. *Connecticut*—New London, in bloom, 6th, roses. Southington, in bloom, 3rd, syringia. *New York*—Ardenia, 30th, rye nearly ripe, oats in full head, potatoes looking fair; season very early, crops maturing rapidly; Palermo, in bloom, 3rd, white daisies and clover, 8th, wheat, 12th, locust, 16th, yarrow, 28th, sweet alder; ripe, 10th, strawberries, 25th, red raspberries. Waterburg, ripe, 5th, strawberries; heading, 1st, wheat, 16th, barley; 16th, hessian fly damaging wheat. Starkey, 24th, oats heading. Vernon Centre, 15th, ripe strawberries and potatoes; 25th, haying commenced; 30th, apples promise a full crop, pears and plums somewhat blighted, other fruits in fair condition; hessian fly and weevil injuring wheat. Wappingers Falls, in bloom, 1st, blackberry, 3rd, alder, 7th, moss rose, june pinks, 14th, snapdragon, 19th, potatoes; ripe, 1st, cherries, 16th, red and black currants, 20th, raspberries; 1st, wheat heading, injured by hessian fly; 7th, green peas, for table use; 10th, corn looks yellow and very small; 14th, hessian fly injuring rye; 22nd, oats heading. *New Jersey*—Vineland, 30th, grass, wheat and rye in good condition; sweet potatoes and corn not as good as usual; peaches and apples fair; grapes injured by grape-rot; berries excellent. Freehold, 30th, hay crop very heavy and matured. *Virginia*—near Keswick, harvesting, 7th, wheat, 20th, oats; corn on good land 3 to 5 feet high; hay, good and harvesting; ripe, 25th, tomatoes. Wytheville, ripe, 18th, wheat and currants. *North Carolina*—Fayetteville, ripe, 1st, plums and blackberries, 16th, tomatoes, 28th, peaches; 20th, green corn for table use. Bladen Co., in bloom 26th, cotton. *Florida*—Milton, ripe, 1st, watermelons, peaches, apples, pears, blackberries and huckleberries; 21st, second crop of bush beans. Daytona, ripe, 30th, figs, large crop. *Mississippi*—near Brookhaven, in bloom, 15th, cotton; 9th, corn in silk. *Texas*—near Melissa, 30th, corn prospect good, cotton backward by reason of cool, wet weather; grass very fine. *Tennessee*—near Cleveland, 14th grapes and early peaches rotting. 8th, wheat badly damaged by rust. *Ohio*—Ringgold, wheat best for thirty years, corn fair, oats very good, and tobacco three weeks early, hay crop and fruits of all kinds extra. Milford Valley, 29th, wheat all harvested. Lancaster Co., 29th, harvesting wheat, yield extremely large. Middletown and Circleville, 29th, wheat nearly all harvested, crop very fine. Jacksonburg, ripe, 10th, cherries, 24th, early rose potatoes, gooseberries and red currants; harvesting, 5th, barley, 24th, wheat, 15th, red clover; 6th, green peas for table use. *Indiana*—Vevay, 8th, vegetation and fruits suffering from injurious insects; 18th, wheat harvested; 24th; yield far above the average; in bloom, 18th, chesnut. Rising Sun, 29th, wheat harvested, excellent crop. *Illinois*—Noble, 28th, wheat harvest completed, quality excellent, yield good. *Missouri*—Corning, 20th, corn in silk. Lebanon, 3rd, wheat harvest commenced; ripe, 16th, blackberries, 19th, peaches. Springfield, 4th, corn in silk; ripe, 11th, peaches; 30th, harvesting finished. Oregon, in bloom, 11th, may-weed; 13th, dogwood; 20th, catnip; ripe, 1st, raspberries, 10th, early apples, 12th, cottonwood-seeds, 22nd, peaches.